Cultivating Online English Learner Autonomy in Internet Plus Era: A DST Perspective

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Abstract

Based on Dynamic Systems Theory (DST), the article proposes that cultivating online English learner autonomy is a complex dynamic system. Under the interactions of learners, learning resources, learning task and learning environment, the development of online English learner autonomy is featured with being non-linearity, self-organization and "butterfly effects". It proposes that in internet plus era, online English learner autonomy can be improved in resource-based, technology-based, student-based and teacher-based approach.

Key words: Online English learner autonomy; DST; Cultivation

INTRODUCTION

Learner autonomy or autonomous learning has triggered Chinese and foreign scholars' concern as an essential condition of effective learning since Holec's introduction of the concept into the field of second language learning research, an issue principally of students taking greater control over the content and methods of learning (Holec, 1981).

However, autonomous English learning in Chinese colleges and universities is in the development stage. Under the influence of examination-oriented education and crammed teaching methods, many college students in China are indifferent to autonomous English learning, deficient in their meta-cognitive learning ability, weak in intrinsic motivations but stronger in extrinsic motivations, poor in self-discipline and self-reflection. Meanwhile, teachers are insufficient in effective monitoring and assessment of the students' self-regulated learning. And the utilization of learning resources is low.

In internet plus era, foreign language teaching enters a new era of digitization and individualization, with the shift from PaaS (Platform as a Service) to SaaS (Software as a Service) and to DaaS (Data as a Service) (Gan & He, 2016). Learner autonomy has become one of the indispensable survival skills in the 21st century. In China, fostering English learner autonomy conforms to requirements of *Outline of National Plan for Medium and Long-term Educational Reform and Development (2012-2020)* and *College English Curriculum Requirements* (2007). Cultivating online English learner autonomy benefits having an insight into students' cognitive laws, raising their English learning efficiency and promoting English teaching reform in China.

Boosting each learner's non-linear language development through interactions of resources, strategies and relationships at multiple levels and in multiple dimensions, Dynamic Systems Theory (DST) provides a new insight into the complexities and dynamic changes of online English learner autonomy over time and environment.

1. LITERATURE REVIEW

Though learner autonomy has ranked one of the vital educational targets since the 1990s, scholars diverge in their understandings about autonomous learning from

their different perspectives. Holec (1981) defines learner autonomy as a capacity to be responsible for a learner's learning, manifested in five aspects: setting learning objectives; determining learning contents and speed; selecting learning methods, techniques and strategies; controlling and monitoring learning process such as time, venue, rhythm; assessing and evaluating learning effects. From the perspective of learning environment, Zimmerman (1989) holds that autonomous learning is inseparable from a learner's material environment, classroom environment and social environment. From the cognitive psychological angle, Little (1991) deems an autonomous learner as a decision-maker who has, or will develop the capacity for choosing from among available tools and resources to create what is needed for the task in hand while Dickinson (1987) emphasizes that autonomous learning is a learning attitude and an independent learning capacity as well. Su (2004) proposes that autonomous foreign language learning includes three essential factors: attitude, capacity and environment.

Besides, diverse theoretical stances have been advocated for autonomous learning, including theories based on Skinner's behaviorism, Piaget's constructivist theory, Vygotsky's sociocultural theory, social learning theories, and information-processing theories. According to behaviorists, autonomous learning contains self-monitoring, self-guidance and self-reinforcement. Corno (1986) classifies autonomous learning into implicit self-regulation (including cognitive monitoring, affective monitoring and motivational monitoring) and explicit self-regulation (comprising object control and task control).

In comparison, studies on English learner autonomy in China is in the growth stage, developing from the initial theory introduction (Li, 1998, Zheng, 2000; Qi, 2002) to cultivating English learner autonomy by learning strategies training (Wang, 2003; Wang, 2014), stimulating students' learning motivations (Wei, 2013), teaching reform (Liu, 2014; Lü, 2016) or analyzing effects of learner factors on autonomous learning (Xu, 2014). With a wider research scope, diverse perspectives, increasing combination of qualitative analysis with quantitative analysis, Chinese scholars explore connotations , components and operation system of autonomous College English learning, develop a scale of measuring autonomous English learning ability, and evaluate effects of autonomous College English learning. However, few studies touch upon integrating developing English learner autonomy with advances in information technology in internet plus era.

Originally a pure mathematical paradigm expressed in the equation of $x_{(t+1)} = f(x_{(t)})$, DST expounds how properties of a complex system change and develop over time, i.e., how a state x at t is transformed into a new state x at time $t+1$, featured with dynamic, non-linearity, completeness, and interconnection, with the focus on the core issue of the dynamics of its self-organization within the complex system (Larsen-Freeman, 2008). It interprets

well real-time changes of English learners' online learning behaviors and their dynamic adaptation to the environment over time.

2. ONLINE ENGLISH LEARNER AUTONOMY IN INTERNET PLUS CONTEXT: A DST PERSPECTIVE

A language learner, in DST perspective, is a dynamic subsystem within a social system composed of interacting internal dynamic sub-subsystems operating within a multitude of other external dynamic systems (de Bot et al., 2007). It is the same case with online English learner autonomy in internet plus era.

2.1 Composition

Cultivating online English learner autonomy is a complex dynamic system composed of interactions and interconnections of learners, learning resources, learning task and learning environment, each of which contains a large number of highly interconnected elements. All variables are interrelated, and changes in one variable have an impact on all other variables within the system and produce an unexpected outcome.

Directly determining diversities and effects of autonomous learning, individual differences can be categorized into controllable and uncontrollable (Wen, 2003): The former covers inborn factors like age and genders while the latter includes cognitive differences, affective differences and learning strategies. Cognitive differences are made up of intelligence, language aptitude and working memory while affective differences contain factors like learning motivations, learning attitudes, learning styles, personalities, anxiety and willingness to communicate. Learning strategies can be subdivided into meta-cognitive, cognitive and affective strategies.

In internet plus era, with the application of WAP technology, portable terminals and other new media in the educational field such as cloud education platform, wisdom classroom, cloud desks and E-books, online English learning resources have evolved from plane text to multimedia, from multi-modality to WE-media, from test database to subject resource database; greatly enriched in quantity as well as in quality, in forms as well as in contents. These abundant resources require that a learner possess a stronger meta-cognitive capacity and self-discipline, adept at self-monitoring, self-regulation, self-assessment and self-reflection.

Learning task can be either singular skill training in listening, speaking, reading, writing and translation or an integrated exercise. It may be a dictation, a puzzle game, a presentation, a story, a drama, a speech, a passage recitation, a rewriting, focusing either on the correctness of the content or the form or the both. Requirements for each task vary in the process of pre-task, task-cycle and

post-task, and the task may be accomplished either by an individual, a pair work or a group work.

With the integration of new information technology such as mobile internet, cloud computing and artificial intelligence into educational field, online autonomous learning environment comprises learning resources, cognitive tools (online learning platform, online courses like MOOCs and SPOCs, BBS, tablets, intelligence mobile phone, searching engines, social networks instant messaging tools, blogs, intelligent mobile phones, cloud classroom, learning and social software), regulations of a learning community (formed out of the identical learning goals and learning interests) and interpersonal communicative strategies. They all exert a direct effect on the quantity and quality of the target language input and the opportunities of the output.

Being individual and social, online autonomous English learning can take place anytime and anywhere, diversified in forms and fragmented in the process, free from the restrictions of time, space and identity. Its effects are determined by interactions among variables in the system, but cannot be decomposed into the isolated act of any component or any variable within the system.

2.2 Characteristics

In internet plus era, the development of online English learner autonomy is by no means a simple change in quantity or a level progression, but a dynamic, interactive, self-organized process with butterfly effects

2.2.1 Dynamic

Online autonomous learning is essentially interactive, especially in internet plus era. The diversity and dynamic of online English learner autonomy fully manifest in learners' learning behavior, learning process and learning effects.

As for learning behaviors, online English learner autonomy can be operational interaction with the media interface, information interaction with the learning resources and social interaction with the learning community. Operational interaction, a process of retrieving information, guarantees the reliability and validity of learning while information interaction entails information exchange and information processing. Contents of the social interaction of online autonomous learning comprise exchanges and processing of the social affections and knowledge while its organization includes a virtual learning community course-oriented, project-based and network social platform-dependent. The interactions can be among teachers and students, among students or among members of a learning community; it can be bilateral or multilateral; it can take place real time or non-real time; and it can be of different types such as Q & A, problem-solving, resource-sharing and communication. Consequently, online English learner autonomy behaviors change over time and context, sometimes abrupt, sometimes gentle and sometimes irregular.

Besides dynamic learning behaviors, online autonomous learning process is dynamic. According to Zimmerman (2000), an internal learning process is composed of three phases: forethought, performance/volitional control and self-reflection. Forethought phase entails two major classes: task analysis and self-motivation. Task-analysis includes goal setting and strategy planning. Performance phase processes can be divided into self-control and self-observation. Self-reflection phase processes cover two major classes: self-judgment and self-reaction. Neither a learner's cognitive process nor his meta-cognitive process in the online autonomous learning develops linearly but with of ups and downs, even standstills. Meanwhile, a learner's identity may transform into different roles: a student, a teacher, an expert, a partner or a contributor of information. The acquisition of new knowledge and new concepts, upgrading of old knowledge and inputing the new information he innovates to the learning community vary from person to person. Even with the identical learning objective, learners' self-monitoring and self-assessment differ sharply.

In addition, online autonomous learning effects are dynamic, with the co-existence of one-cause-multiple-effect and one-effect-multiple-cause, determined by a learner's initial state, coordination of the complex system, resources of a learner's cognitive system and learning environment. The interaction between an online autonomous English learner and learning environment affects results and quality of his/her learning. A learner's learning objectives, peer relationships in the learning community, organization of the online autonomous learning and its assessment jointly affect his/her learning belief and learning effects. Furthermore, cognitive individual differences in intelligence, language aptitude, working memory decide a learner's processing and storage of the second language input, and his/her reorganization and integration of inter-language system. Simultaneously, learner factors such as aptitude, working memory and noticing influence the processing of different learning tasks.

Under the plural interactions among factors in the subsystem and components of each factor in the complex system, online English learner autonomy fluctuates within a continuum: sometimes progressing, sometimes regressing, sometimes reaching a peak, sometimes descending to a bottom, and making the learning effects somewhat unpredictable.

2.2.2 Self-Organization

Self-organization refers to the emergence of some form of overall order or coordination out of an initially disordered system until the orderly increase of the system reaches a critical point caused by the openness of the system (Socket, 2013). The self-organization of an English learner's online autonomy can be found in his/her learning behavior and the learning process as well, both simple and complex. Not necessarily controlled by any auxiliary agent outside of the system, the self-organization can be spontaneous,

often triggered by random fluctuations that are amplified by positive feedback. Consequently, the system can be in two states: attractor (attracted by certain factor, in a superficial stagnant state with stable convergence and low sensitivity to smaller fluctuations) and repeller (in a violent upheaval) (Thelen & Smith, 1994).

As essential driving forces in a system, the attractor state and the repeller state may be stable, exerting the same positive or negative influence throughout the learning process (Sockett, 2013). In the attractor state, for example, bilingual subtitles in an English film or a TV series may initially facilitate an English learner's better understanding of the plot and having an access to authentic documents but later these subtitles can somewhat hinder the students' language processing. Such a self-organization is typically robust and able to survive and, even, self-repair substantial damage or perturbations. The interaction between the stability and evolution provides potentials for the changes of the system. Due to decreasing demands of energy from connected growers such as learner factors, learning resources, learning environment and learning task, not all the subsystems need the equal energy; the uneven distribution of its subordinate variables and their interaction in the form of competition or cooperation generate the reorganization of the system and open self-adaptation to the external environment. A change in one variable in the system influences other variables and causes the fluctuation of the system. When growth, accumulation and surge in variables reach to a certain level, online English learner autonomy has been relatively stable, affecting learning effects.

2.2.3 Butterfly Effect

"Butterfly effect" refers to a phenomenon when the development of some dynamic systems appears to be highly dependent on the initial state, minor differences at the beginning may have dramatic consequences in the long run (de Bot et al., 2007). In other words, some minor changes may generate huge effects while major perturbations may be adapted by the system without much change. Nunan (1997) proposes that an autonomous learner goes through five stages: awareness, involvement, intervention, creation and transcendence. When a learner's dynamic adaptation to the environment reaches a critical value, his/her autonomous English learning moves from one attractor state to another and produces iteration, the learner may find a sudden jump or decline in his/her online autonomous learning ability, causing "butterfly effect". For instance, when a student is eager to gain a higher score in IELTS in order to go on further study abroad, he may find a sudden rise in his fluency and accuracy in speaking and writing after numerous simulation tests, attending online lectures and offline coaching and optimizing his learning strategies. But sometimes online English learner autonomy may dilute suddenly either out of his confusion, frustration and over-anxiety about the sudden change of

the learning responsibility and the online learning task or self-indulgence, either performance-avoidance or motivation deficiency, either improper learning strategies or a mixture of all these elements.

3. APPROACHES TO CULTIVATE ONLINE ENGLISH LEARNER AUTONOMY IN INTERNET PLUS ERA

In internet plus era, fostering online English learning autonomy in China is a long-term and challenging systematic project. It can be resource-based, technology-based, and learner-based and teacher-based, calling for joint efforts from students, teachers, colleges and universities.

3.1 Resource-Based & Technology-Based

Resource-based approach aims to help students to gradually form autonomous learning awareness, maximize their learning ability by increasing the availability and utilization of the learning resources. It requires that an autonomous online English learner clarifies the target, contents, requirements and learning strategies of employing learning resources, the division of learning tasks and relationship among different parts of the task, the distribution of his/her time and energy. Besides, an English learner can gain effective personalized scaffolding support and guidance about using the learning resources so as to deepen his/her understanding of grammatical rules, pragmatic features and semantic expressions of the discourse he/she has learned to accomplish the meaning negotiations, stimulate and maintain his/her English learning interest, cultivate his/her critical thinking ability so as to increase his/her learning efficiency. Our students, the natives of information age, are adept at processing information promptly. By means of Blogs, Wikipedia and We-media, some autonomous online English learners are a claimer and the creator of the learning resources; by sharing, reorganization and creation; some learners become the channels of spreading the knowledge. The stronger autonomous learning awareness, the higher self-assessment ability he/she gets.

Complementary to resource-based approach, technology-based approach raises learners' availability and utilization of learning resources. Employment of learning analytic technologies such as Degrees of Reading Power, Point of Originality, Open Essayist into online English learning can help English learners enjoy personalized reading, writing and assessment, satisfy their diversified cognitive and emotional requirements, release their individuality and help them gain a pleasant learning experience. A case in point in China is the application of pigai.net.org into correcting students' English writings. Under the guidance of an English teacher, an English learner can collect online writing material, techniques and

samples from the abundant online learning resources and conduct negotiations real-time or non-real-time with his/her peers or the teacher about the themes. Besides, he/she can polish his/her writing repeatedly to raise its quality according to the online feedback. Meanwhile, by sharing his/her own data and gaining other peers' data, he/she can exchange, share learning philosophies, learning methods and learning resources with his/her learning partners to raise their cooperative learning ability.

To adopt resource-based and technology-based approach effectively, colleges and universities are encouraged to construct an autonomous English learning center, enrich and update the learning resource bank with latest learning analytic tools, organize English teachers to attend regular training to raise their online English teaching ability, strengthen the construction of online courses such as MOOCs, SPOCs and flipped classroom with their distinct characteristics.

3.2 Learner-Based

In internet plus era, knowledge explosion surpasses a person's cognitive ability in the economic globalization context, human-computer integrated thinking system gradually becomes a fundamental cognitive access to the modern world. Online Autonomous English learning is featured with initiatives, independence, openness and interactivity. To enhance online English learner autonomy, it is essential that students have a positive attitude towards autonomous learning and keep their learning passion, initiation and creation. The more positive attitude a student holds, the more intrinsic motivations he/she will stimulate, the more active, initiative and creative he/she will be, and better learning effects he/she will gain. An English learner can develop his/her online autonomy only when he/she shows interest in the learning and he really realizes his responsibility for the learning and his efforts decides learning effects, only when he is stimulated by intrinsic motivations rather than by instrumental motivations like passing CET-4 or CET-6, only when he is mastery-oriented rather than performance-oriented.

Besides, strengthening English learners' meta-cognition and self-efficacy contribute to enhancing online English learner autonomy. If an online autonomous English learner is strongly motivated and much more mastery-oriented, he will have a general understanding of the characteristics and requirements of the online autonomous learning, its stage objectives, specific tasks and requirements, make a specific practicable learning plan; he will employ deep processing strategies like meta-cognitive learning strategies to identify the materials to be learned, sequence the material according to its difficulty, starting from easy simple concepts and then slowly moving on to more difficult ones, he will adjust his performance goal into mastery goal, he will not hesitate to seek help in the online learning community when necessary and endeavoring to manage time and the environment more effectively, he will monitor his learning behaviors, assess them and reflect, and he will outdo students who are afraid to seek help.

Last but not the least, harmonious healthy friendly interpersonal relationships with the peers in the learning community in cooperative learning and team work benefits developing online English learner autonomy by stimulating learners' learning initiations and creations.

3.3 Teacher-Based

Online autonomous English learning by no means belittles a teacher's role or allows students to follow their inclinations at random. Instead, a teacher is obliged to act in different roles in internet plus era: a guide, a goal setter, a resource provider, a promoter, a facilitator and an assessor.

As a counselor, an English teacher is obliged to help students build up a correct and positive attitude towards autonomous learning, strengthen their sense of responsibility, and raise their autonomous learning awareness. Meanwhile, it is better for an English teacher to give students some extra training in online learning strategies, especially meta-cognitive learning strategies, clarify the general learning goal, specific learning objectives and requirements for each course and help students learn English in cooperation and discovery, and give full play to their initiations and creations. In internet plus era, an English teacher, the resource provider, may recommend students some English learning websites, MOOCs, SPOCs, bbs, mobile software and learning analytic tools. He can keep communicative lines open by creating opportunities for students to discuss and communicate, establishing students' portfolios to keep track of students' online learning and providing necessary help and timely feedback. As a facilitator, an English teacher is obliged to provide students mental and technical support. He may encourage students to build up confidence and overcome learning difficulties and obstacles in the achievement goal-oriented learning environment, keep their learning passions and motivations by taking advantage of their over-concern about their scores to raise their extrinsic motivations, organizing amusing online learning activities, and combining the learning task with the students' learning interests to enhance their intrinsic motivations.

As an assessor, an English teacher can help learners to make an objective scientific self-evaluations about their current learning to lay a solid foundation for their further study. By using learning analytic tools like Google Analytics, Netlytic, SNAPP to analyze students' bbs, Wechat information flow, students' involvement and contribution in online learning, an English teacher can find out students' learning difficulties, have an insight into students' interactions with the learning resources, analyze their needs and learning progress, and dig out their learning potentials so as to optimize representations and varieties of learning resources according to students'

learning preferences and plan their learning path rationally. Furthermore, an English teacher may as well combine online autonomous learning with classroom instructions and offline extracurricular activities. In evaluating an English learner's online learning performance, it is better for a teacher to combine formative assessment with summative assessment, pay close attention to students' dynamic learning process, monitor and reflect students' development and effects in the learning.

Online Autonomous English learning demands an English teacher's adherence to student-oriented educational philosophy, active involvement and correct understanding of his new roles.

CONCLUSION

Integrating cognitive view and social view of language development, DST gives insight into real-time changes of online English learner autonomy, a dynamic complex system consisting of interacting interconnected components: learners, learning resources, learning task and learning environment. From a micro perspective, the development of an online English learner autonomy manifests a cognitive individual's dynamic adaptation to the learning environment, a mental state and a mental process as well; from a macro perspective, the improvement of an online English learner autonomy is restrained by interactions among learning resources, learning tasks and learners' individual differences in the complex system and elements of each component within the subsystem at multiple levels and in multiple dimensions. Such autonomy is dynamic, changing over time, self-organized and having butterfly effects. In internet plus era, abundant learning resources and incremental employment of updating educational technology provide technical support and guarantee to raise online English learner autonomy. As students are masters of their learning, stimulating and maintaining English learners' learning interest and learning initiatives, mobilizing their intrinsic motivations, helping them learning by doing and doing by learning is indispensable to the improvement of their online learning autonomy. Meanwhile, English teachers should give priority to strengthening students' autonomous learning awareness, initiative and creation to promote students' sustainable and all-round development.

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